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DIRECTORATE OF
INTELLIGENCE

Intelligence Memorandum

Pakistan: Recent Developments In Agriculture

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CENTRAL INTELLIGENCE AGENCY
Directorate of Intelligence
March 1971

INTELLIGENCE MEMORANDUM

Pakistan: Recent Developments In Agriculture

Introduction

Pakistan's foodgrain production in 1968* reached a record 20.5 million tons, or 16% more than in 1965, the best previous year. Since this impressive breakthrough, which occurred mainly in West Pakistan, there has been considerable additional progress. Wheat production in West Pakistan, however, has increased less than expected, and hopes for countrywide self-sufficiency in foodgrains have not been realized. Moreover, disastrous weather conditions -- most recently the cyclone of November 1970 -- in rice-growing East Pakistan have slowed production growth there. This memorandum reviews developments in the foodgrains sector since the breakthrough and attempts to assess the outlook for foodgrains over the next few years.

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* *The crop year in Pakistan, 1 July-30 June, coincides with the fiscal and trade years and is referred to as the year in which the crop year ends.*

Note: This memorandum was prepared by the Office of Economic Research and coordinated within the Directorate of Intelligence.

Background: the Breakthrough*

West Pakistan

1. The largest increases in foodgrain production during the breakthrough occurred in West Pakistan where production rose 30% between 1965 and 1968 (see the Appendix). A combination of increased use of modern agricultural technology and strong government support helped farms to produce enough foodgrains for the West Wing to feed its population for the first time in almost 20 years. A substantial increase in foodgrain yields resulted from large-scale planting of high-yielding variety (HYV) seeds -- Mexi-Pak wheat and IRRI-8 rice -- a dramatic increase in fertilizer and pesticide use, and even more important, a large increase in irrigated acreage. The new seeds were sown in traditional grain growing areas, and the acreage of cotton, the West's major cash crop, continued to expand. The government supported foodgrain prices, invested generously in agriculture, and subsidized nearly all farm inputs. The West Wing's relatively prosperous farm community responded not only by using increased quantities of new seeds and agricultural chemicals but also by sharply increasing the number of tubewells drilled. This, along with the continued receipt of massive Western aid for the Indus Basin Project, markedly increased the irrigated acreage.

East Pakistan

2. The foodgrain situation in East Pakistan was quite different. Rice production, the main crop and dietary staple, lagged behind population growth. East Pakistan's agriculture was hindered by a lack of funding and agricultural expertise, a preponderance of exceptionally small farms, and relatively modest water control programs in the face of often devastating monsoons. There was no foreign assistance program comparable to the Indus Basin Project for the East where water control problems were severe. Moreover, most farmers had

* *For a more detailed treatment, see CIA ER IM 69-43,* Pakistan's Agricultural Breakthrough, *April 1969, CONFIDENTIAL.*

very little land and no capital, and this combination strongly inhibited technological improvement.

The Foodgrain Situation Since the Breakthrough

West Pakistan

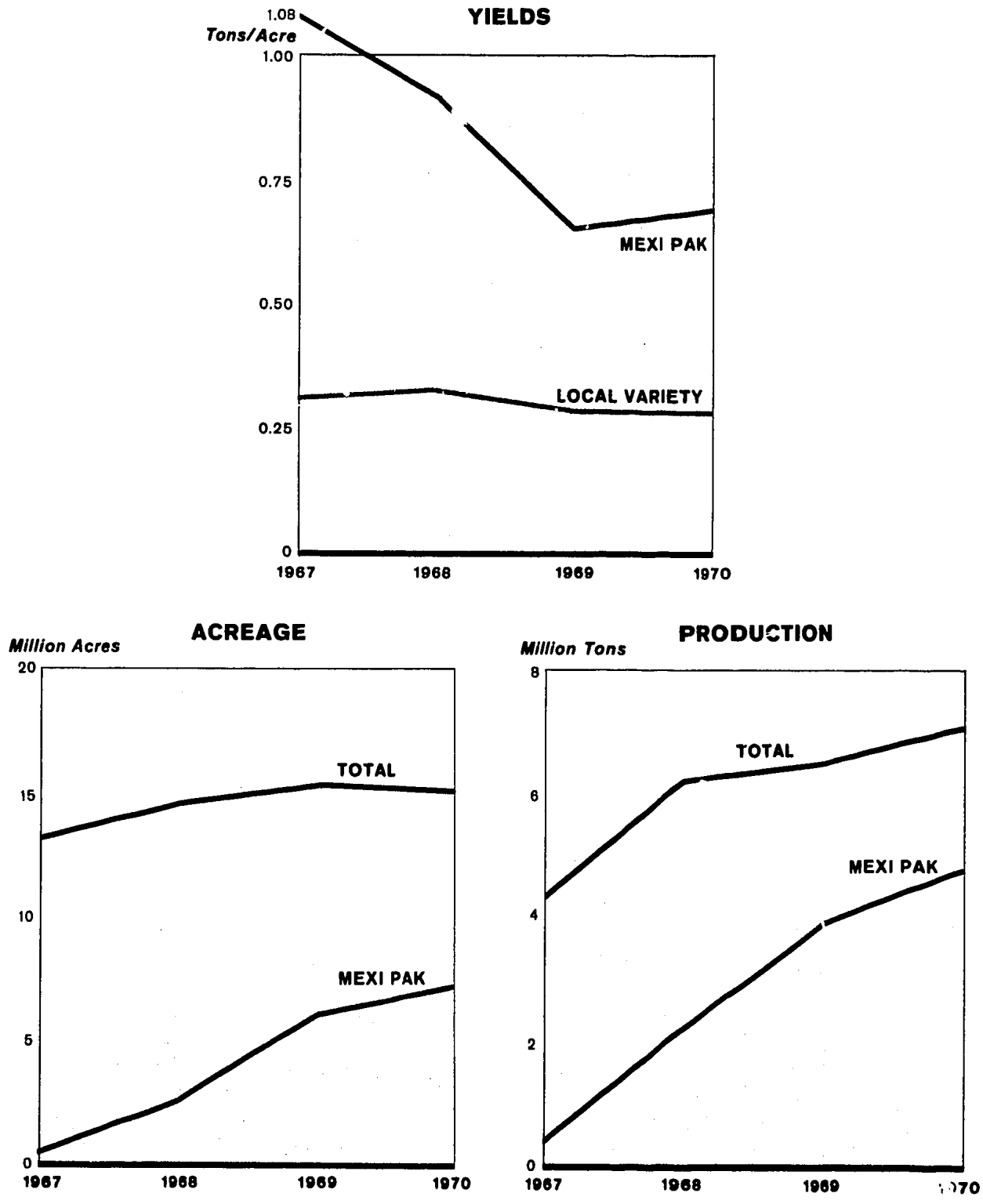
3. Areas planted with high-yielding wheat and rice varieties have accounted for the entire increase in grain output in the past three years. Production of Mexi-Pak wheat increased by over 4.5 million long tons and IRRI rice by about 1 million tons. Total production from all grains rose by only 3.9 million tons. As land was increasingly shifted to the HYV, production of traditional wheat declined over 40% to 2.3 million tons and production of traditional rice stagnated at 1.3 million tons. HYV wheat seeds are now planted on almost half the West's wheat lands. HYV yields have declined, however, as increasingly poorer lands have been switched to the new seeds, but the lower HYV yields remain more than double those of local varieties (see Figure 1). IRRI rice has been planted on less than a third of the West's rice acreage and yields also are almost double those of the traditional varieties of rice. Yields of the traditional rice varieties have also gone up because of the application of improved technology and increased fertilizer usage.

4. In the two years since the breakthrough in 1968, wheat production in the West, where it is the major food crop and dietary staple, increased 12.5% to 7.1 million tons in 1970. This increase, however, was not as large as the government anticipated.

5. In 1969 the acreage planted to high-yielding wheat more than doubled, but unfavorable weather (high temperatures and humidity at the time of pollination) held the overall increase in production to only 3%. The share of irrigated wheat land planted in HYV seeds increased sharply from 24% in 1968 to well over 50% in 1969. Yields from the Mexi-Pak seeds, however, are extremely susceptible to variations in water supply, and they declined 28% in 1969 because of the weather, while yields of local irrigated varieties declined only 5%.

Figure 1

WEST PAKISTAN: Wheat Production



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6. The weather improved in 1970 and wheat production increased sharply, by 9%. The area planted to Mexi-Pak seeds expanded more slowly, presumably because it already comprised most of the well-irrigated wheat land. Increased planting of Mexi-Pak seeds enabled overall yields for wheat to improve almost 9%. Yields of the Mexi-Pak wheat itself are estimated to have increased only slightly, remaining some 25% below the record yields achieved in 1968 as seeds were applied increasingly to less suitable lands.

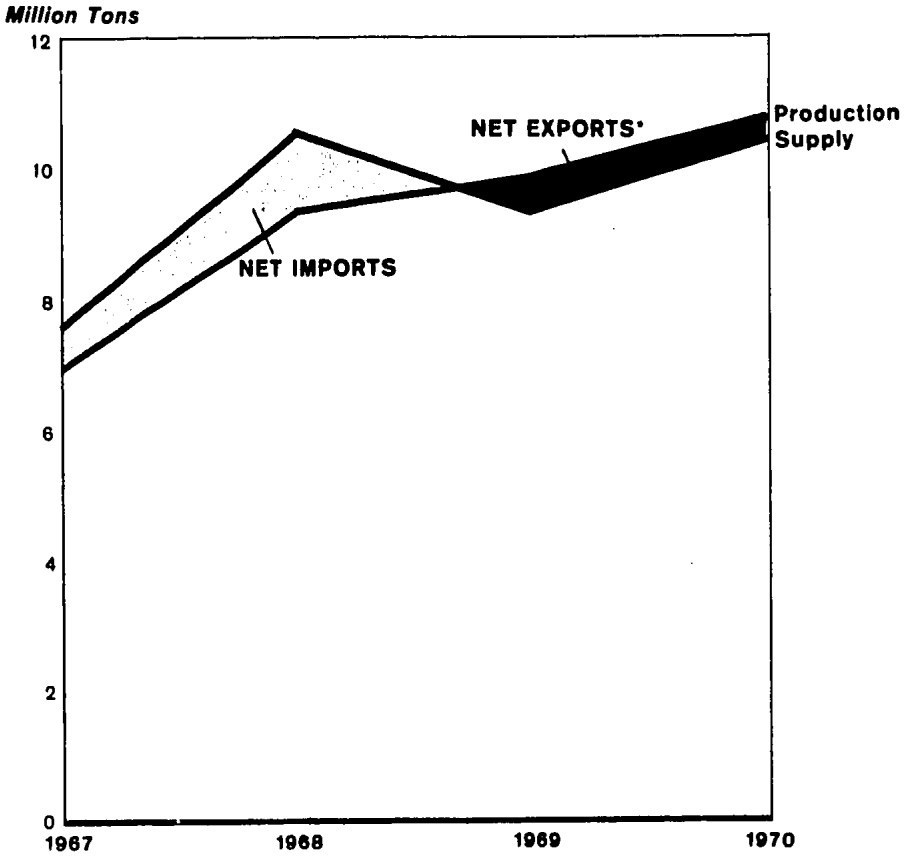
7. The West has also greatly expanded its use of the new IRRI rice seeds. From 1968 to 1970, rice production jumped 58% to 2.3 million tons. Not much additional acreage has been planted to rice, but yields increased more than 40% as the share of the total rice acreage devoted to IRRI increased from less than 0.3% in 1968 to about one-third in 1970.

8. Since the breakthrough in 1968, total foodgrain production has continued to increase faster than population and West Pakistan is now a net exporter of foodgrains. During 1969-70, the West Wing sharply increased its grain shipments to the East Wing (see Figure 2). While wheat exports to the East remained small (only 170,000 tons during the two-year period 1969-70), rice exports, for which Eastern demand is much greater, increased rapidly reaching 400,000 tons in 1970.

9. During the two years since the breakthrough, the central government has continued to give priority to agriculture. West Pakistan has continued to benefit from large investments in agriculture and water development although competitive demands, especially for increased investment in the East and for essential social services, kept investment in the West from rising above the levels of the previous two years. Expenditures for the Indus Basin Project were about $400 million (financed largely from foreign aid), a 41% increase over the previous two-year period. Domestically financed public investment in agriculture and water development added $240 million more. Private investment continued to be almost as large as that in the public sector.

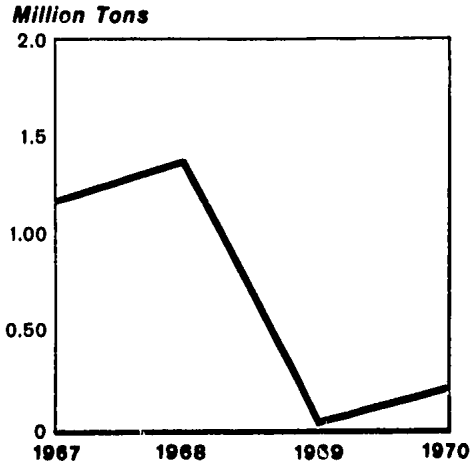
Figure 2

WEST PAKISTAN: Foodgrain Production and Trade

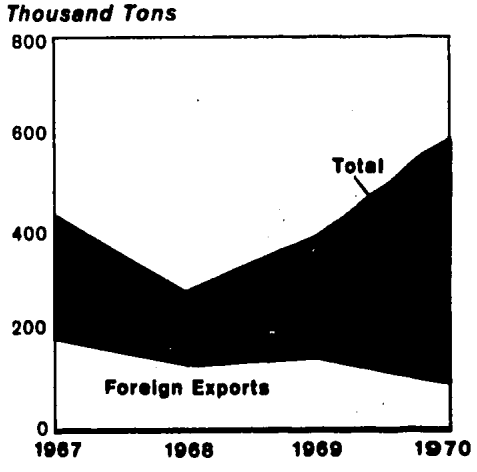


*Including Deliveries to East Pakistan

IMPORTS



EXPORTS



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10. Large investments have enabled West Pakistan to continue to increase water-assured acreage, as well as the fertilizer and pesticides supplies needed to make effective use of the new seeds. During the past two years, the number of private tubewells (see Figure 3), a major factor in West Pakistan's irrigation improvements, increased almost 20% and the number of public tubewells, 25% (see the accompanying tabulation).

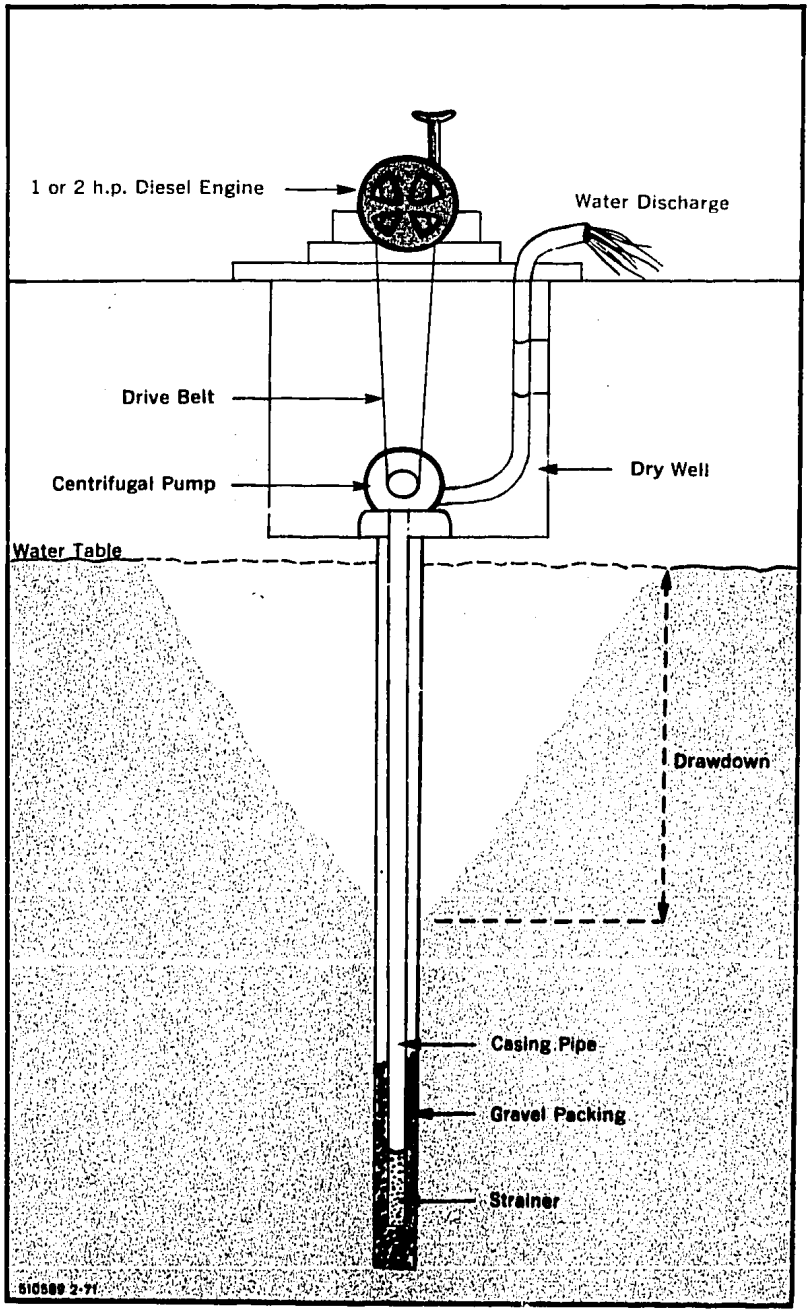
	Number of Tubewells	
Sector	1968	1970
Private	60,000	71,000
Public	6,400	8,000

These tubewells, supplemented by additional canal water, provided West Pakistan with the potential to irrigate an additional 1.4 million to 1.6 million acres. Although inadequate electricity has kept performance below potential, more than 1 million additional irrigated acres have been added in West Pakistan -- or a 10% increase in irrigated area -- since the breakthrough in 1968.

East Pakistan

11. Rice production in the East during the past two years has been increasing at only about the same rate as population -- some 3½% annually. Improvement in water control, a necessary condition for effective utilization of HYV seeds, has been slow. In the last two years, about 500,000 acres of agricultural land, only some 2% of the area sown to grain, were brought under new water control measures. Actually, much of the rice area has some form of irrigation, but mainly due to flooding; there is usually too much water for the new seed varieties in the wet season and too little in the dry. Flood control is extremely expensive and this requires government action. Irrigation in the dry season is less difficult. Low-lift pumps can be installed to lift water to the fields when rivers and streams are low. The number of these pumps increased sharply from about

Typical Private Tubewell Figure 3



The tubewell, as shown here, consists of a cylindrical steel casing inserted in a borehole of slightly greater size, the gap being filled with packing gravel. A section of the casing is perforated to allow water to enter.

6,500 in 1968 to some 18,000 in 1970. Still the relatively small area irrigated by the pumps has meant that there has been little success in expanding IRRI rice which requires that the timing and volume of irrigation be precisely controlled. Local crop diseases have also held down the spread of new seeds. At the end of 1970, the East had less than 3% of its total rice acreage of over 25 million acres under IRRI rice.

12. East Pakistan has no scheme comparable to the Indus Basin Project to help overcome its water control problems. Moreover, private agricultural investment is negligible and the region's share of the country's public investment expenditures on agriculture and water development has not increased significantly.

13. During the two years, 1969-70, East Pakistan's foodgrain deficit increased and imports rose by 65% (see Figure 4). Foreign imports reached 1.2 million tons in 1970 and shipments from West Pakistan some 490,000 tons. The West covered 28% of the East's deficit in 1970, compared with only 13% in 1968.

Recent Developments

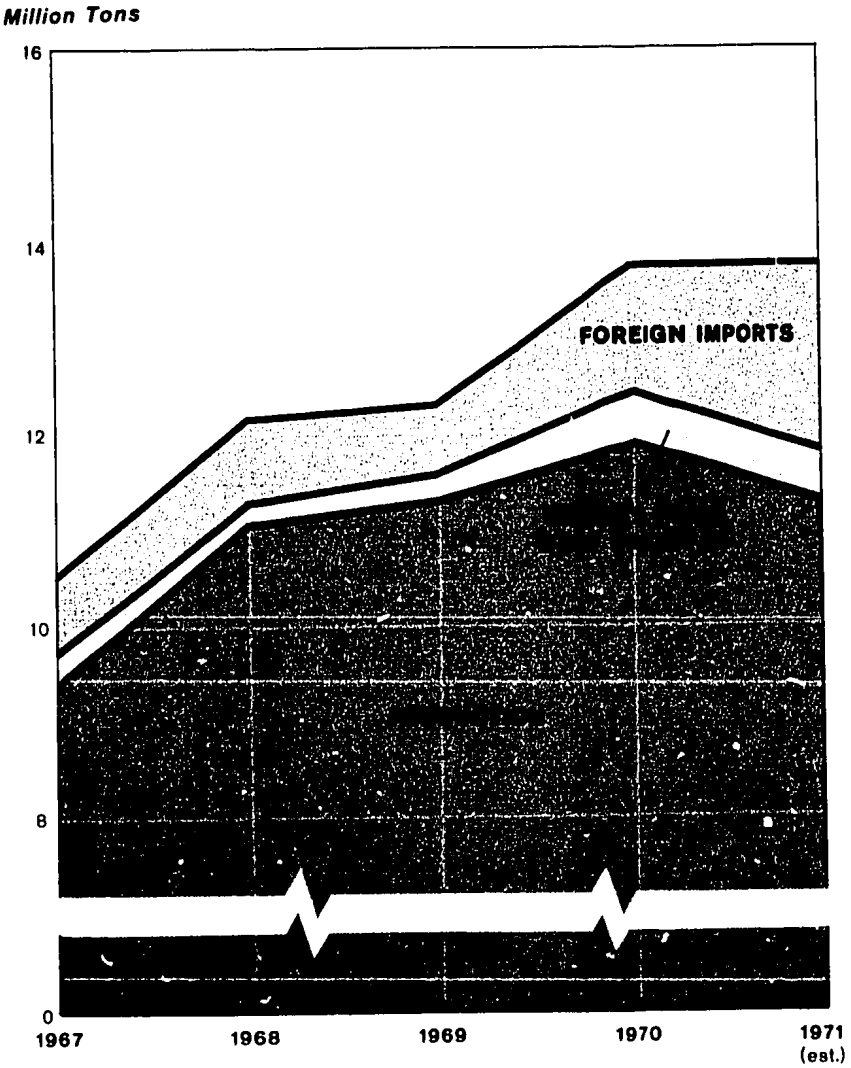
14. Foodgrain production in 1971 in West Pakistan will probably not increase nearly as much as last year's 10%. Preliminary indications point to little growth in wheat production unless rains in early 1971 can overcome the dry spell experienced in the last quarter of 1970. Other foodcrops, too, probably will be affected by the adverse weather.

15. The floods and cyclone in the summer and fall of 1970 severely set back agricultural prospects in the East Wing for 1971.* Rice production apparently will fall to between about 11 million and 11.5 million tons, compared with pre-disaster expectations of 12.3 million tons. Combined wheat and rice imports from foreign sources may exceed

* *See CIA ER IM 70-181*, East Pakistan: Some Economic Consequences of the Floods and Cyclone, *December 1970, CONFIDENTIAL.*

Figure 4

EAST PAKISTAN: Foodgrain Production and Trade



2 million tons this year, about 1.6 times those in 1970. Wheat imports from the United States could reach over 1 million tons, with nearly the same amount from other countries, while West Pakistan will probably supply 500,000 tons of rice.

Balance-of-Payments Implications

16. The country's agricultural programs have had little impact on its balance of payments. Despite the substantial reduction in foreign imports of foodgrain on a country-wide basis, there has been relatively little foreign exchange savings as most of the food imports have been provided under foreign assistance programs. In 1968, for example, about 90% of the $121 million of wheat imported were financed by the US PL 480 program. The sharp import reduction to $76 million in 1970 principally reflected reduced aid shipments. Most of the increase of $30 million in imported fertilizer during this period also was financed through external assistance.

Plans for 1975

17. A new Fourth Five-Year Plan (1971-75) calls for a 36% increase in foodgrain production, compared with a 29% increase during the Third Five-Year Plan period (1966-70). About three-quarters of the planned increase is expected to come from higher yields. Foodgrain imports are to be ended in the last year of the plan. Actual and planned production increases are given in the accompanying table.

18. In the West the planned rate of increase for both wheat and rice is less than that obtained during the Third Plan. The East, where about half of the country's grain is now grown, is scheduled to provide about 50% of the planned increase. In order to achieve this goal, rice production there would have to increase about 2½ times as rapidly as in the previous plan period.

19. Public investment in agriculture including water development is to be increased 80% to about $3.4 billion, of which some $2.3 billion is for water development, to be divided almost equally

Actual and Planned Increases
in Foodgrain Production

	Actual 1966-70		Planned 1971-75	
	Increased Tonnage (Million Tons)	Percent Increase	Increased Tonnage (Million Tons)	Percent Increase
West Pakistan				
Wheat	2.59	57	2.39	34
Rice	1.01	76	1.36	58
Other food-grains	-0.02	-1	0.40	30
Total food-grains	3.58	50	4.15	38
East Pakistan				
Wheat	0.07	233	0.10	100
Rice	1.49	14	3.98	34
Other food-grains	0	0	0.01	100
Total food-grains	1.56	15	4.09	34
Pakistan				
Total food-grains	*5.14*	29	*8.24*	36

between the two wings. About 55% of the West's share, however, is part of the Indus Basin Project with new areas of about 1.2 million acres to be brought under irrigation and 7.5 million acres of already irrigated lands to receive improved water control. Flood protection is to be the primary goal of water development in the East, with some 20% to 30% of the area threatened by floods to

be protected and newly irrigated areas to amount to some 3.5 million acres. Exclusive of water development, $700 million of public sector funds are to be spent in East Pakistan agriculture, and almost $400 million in West Pakistan -- a substantial increase in both wings. The Fourth Plan calls for a near tripling of the fertilizer consumption, nearly as fast as in the previous five years, but from a much higher base, with consumption in the East to increase by more than three times. The area planted to the HYV seeds is also to increase sharply, again especially in the East Wing.

Conclusions

20. West Pakistan, clearly committed to continued technological progress in agriculture, is likely to reach its 1975 foodgrain goals. The plan apparently calls for most of the increase of 2.4 million tons in wheat production to come from an approximate increase of 3.7 million acres in land devoted to HYV wheat seeds. This acreage increase alone, which almost certainly can be achieved, would meet the production goal without any increase over current HYV yields. The traditional varieties are currently planted on about 5 million acres of irrigated land, most of which can be easily switched to HYV, particularly since the bulk of this acreage is scheduled to be provided with improved water control. In addition, continued expansion of private and public tubewells along with the Indus Basin Project will provide an estimated additional increase of 1.2 million acres in new irrigated lands that could also be used for HYV -- either wheat or rice. The planned increase in rice production of some 1.4 million tons could be achieved by planting some 1.6 million additional acres with IRRI rice without any increase in yields. The newly irrigated lands could provide most of this additional acreage. Alternatively, some 1.4 million acres could be shifted from traditional varieties. The proven increases in performance from the HYV should also provide the incentive for greater use of agricultural chemicals for both wheat and rice.

21. In any event, foodgrain production in West Pakistan should continue to increase more rapidly than local requirements. A surplus could develop during the next few years, since East Pakistan prefers rice, and poor quality is an obstacle to exports abroad. Thus wheat acreage may be switched to other crops, particularly cotton and protein rich meat and dairy products, toward the end of the Fourth Plan.

22. East Pakistan is unlikely to meet its rice production goal for 1975. This goal envisions a breakthrough with HYV rice similar to that achieved in the West. The acreage to be planted to the new seeds would have to increase over six times to about 5 million acres at 1970 yields. Water control problems will not permit such a rapid increase on the spring and summer acreage without massive investments over a long period of time. Current water-control spending is concentrated on recovering from last year's disaster and preventing a reoccurrence. While this sort of investment raises average yields over a period of years by reducing average flood losses, it does not help to improve agricultural technology or make the planting of HYV seeds profitable. Most of the success with the HYV has been attained on winter crop acreage -- essentially dry land that has improved irrigation -- where water can be controlled more easily. Inexpensive low lift diesel pumps can irrigate a maximum additional 1 million acres of this land, and 1.5 million acres now planted to traditional varieties could be switched to HYV. But this falls far short of the planned acreage of 5 million acres, and it is unlikely that increased yields of traditional varieties can make up the difference. Seed disease will also be a problem, although IRRI-20, a new HYV rice currently being experimentally grown, may prove more satisfactory.

23. Assuming normal weather in both East and West Pakistan and continued government support to agriculture, production for the country as a whole should increase fast enough to permit a decline in foodgrain imports -- once the emergency grain for the 1970 disaster in East Pakistan has been obtained. Inasmuch as the great part of foodgrain imports are financed by foreign aid, the reduction in imports

will do little to alleviate Pakistan's balance-of-payments problems. West Pakistan's rising production will allow increasingly large deliveries to the East, but some foreign imports will be required. Although improved water control has reduced the country's dependence on weather, an unfavorable monsoon would still reduce production.

24. A substantial shift in government policy could slow agricultural development. While the Fourth Five-Year Plan indicates a clear commitment to the new agricultural technology, the recently elected leaders will be under great pressure to increase agricultural taxes and provide less subsidization in order to raise funds for non-agricultural purposes. Any strong move in this direction will test the extent of the farmers' commitments to the new technology.

APPENDIX

Pakistan: Production of Foodgrains

Million Long Tons

	Wheat		Rice		Other Foodgrains a/	Total Foodgrains
	Total	Mexi-Pak	Total	IRRI		
1964/65						
West Pakistan	4.52	N.A.	1.33	N.A.	1.37	7.22
East Pakistan	0.03	N.A.	10.33	N.A.	0.01	10.37
Total	*4.55*	*N.A.*	*11.66*	*N.A.*	*1.38*	*17.59*
1966/67						
West Pakistan	4.27	0.27	1.34	N.A.	1.30	6.91
East Pakistan	0.06	N.A.	9.42	N.A.	0.02	9.50
Total	*4.33*	*0.27*	*10 76*	*N.A.*	*1.32*	*16.41*
1967/68						
West Pakistan	6.32	2.20	1.48	0.01	1.58	9.38
East Pakistan	0.06	N.A.	10.99	0.23	0.02	11.07
Total	*6.38*	*2.20*	*12.47*	*0.24*	*1.60*	*20.45*

Million Long Tons

	Wheat		Rice		Other Foodgrains a/	Total Foodgrains
	Total	Mexi-Pak	Total	IRRI		
1968/69						
West Pakistan	6.51	3.88	2.00	0.64	1.30	9.81
East Pakistan	0.09	0.02	11.16	0.55	0.01	11.26
Total	*6.60*	*3.90*	*13.16*	*1.19*	*1.31*	*21.07*
1969/70						
West Pakistan	7.11	4.80 (est)	2.34	1.01	1.35 (est)	10.80
East Pakistan	0.10	0.02 (est)	11.82	0.95	0.01 (est)	11.93
Total	*7.21*	*4.82 (est)*	*14.16*	*1.96*	*1.36*	*22.73*
Third Five-Year Plan for 1969/70						
West Pakistan	5.40	N.A.	1.72	N.A.	1.52	8.64
East Pakistan	0.06	N.A.	12.73	N.A.	0.04	12.83
Total	*5.46*	*N.A.*	*14.45*	*N.A.*	*1.56*	*21.47*

a. Bajra, jowar, maize, and barley.